

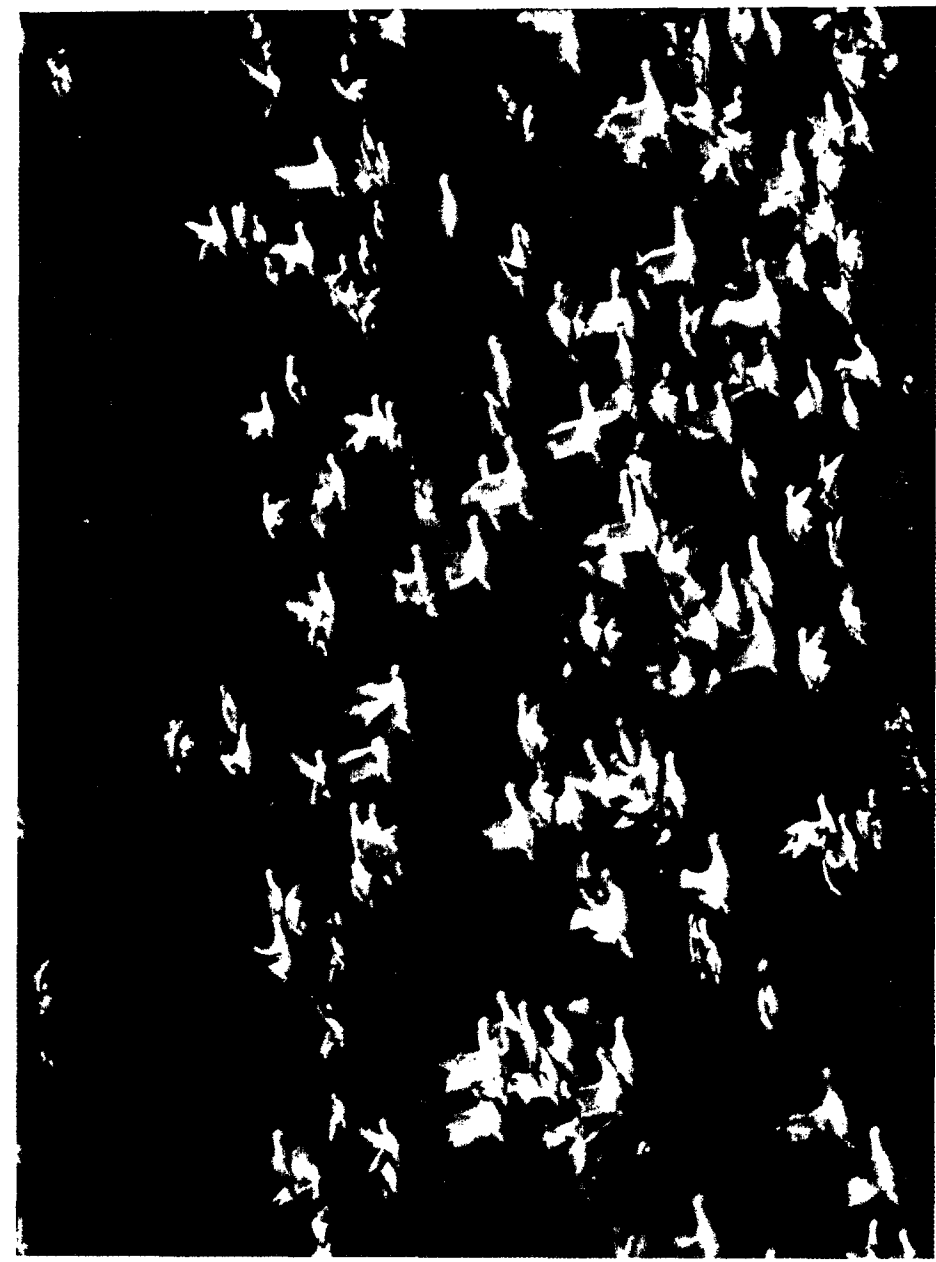
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REPORT ON REFUGEE WATER SUPPLY INVESTIGATION

Central Valley Hydrologic Basin, Calif



VOLUME
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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
MID-PACIFIC REGION

EXECUTIVE SUMMARY

INTRODUCTION

This report on refuge water supply investigations was prepared by the U. S. Bureau of Reclamation (Reclamation) with the cooperation of the Fish and Wildlife Service (Service), California Departments of Fish and Game (DFG) and Water Resources (DWR), California Waterfowl Association (CWA) and the Grassland Resource Conservation District (GRCD). The report presents water, power and wildlife resources data generated since the study began in October, 1986.

PURPOSE

This study was conducted to identify potential water sources and delivery systems for providing a dependable supply of good quality water to the following ten National Wildlife Refuges (NWR), four State Wildlife Management Areas (WMA) and one private wetland areas within the Central Valley hydrologic basin of California, as displayed on Figure S-1.

Modoc NWR
Sacramento NWR
Delevan NWR
Gray Lodge WMA
Sutter NWR

Colusa NWR
Kesterson NWR
San Luis NWR
Merced NWR
Los Banos WMA

Volta WMA
Grassland RCD
Mendota WMA
Kern NWR
Pixley NWR

PROBLEMS AND NEEDS

California's Central Valley is a key wintering stopover for migratory birds within the Pacific Flyway, the westernmost of four migratory waterfowl flyways over the North American continent. Management of the flyway is governed by international treaties with Canada, Mexico, and Japan.

The Pacific Flyway is unlike the other three flyways, however, in that most of the wintering is concentrated in a relatively small area: California's Central Valley. Of the 10 to 12 million waterfowl wintering or passing through California annually, 8 to 10 million birds winter in Central Valley wetlands. This amounts to more than 60 percent of the ducks and geese using the flyway.

Wetland habitat is of critical importance for the preservation of migratory birds of the Pacific Flyway, as well as to resident wildlife. National Wildlife Refuges and State Wildlife Management Areas comprise approximately one-third of the valley's wetland habitat. These wildlife areas, managed by the Service

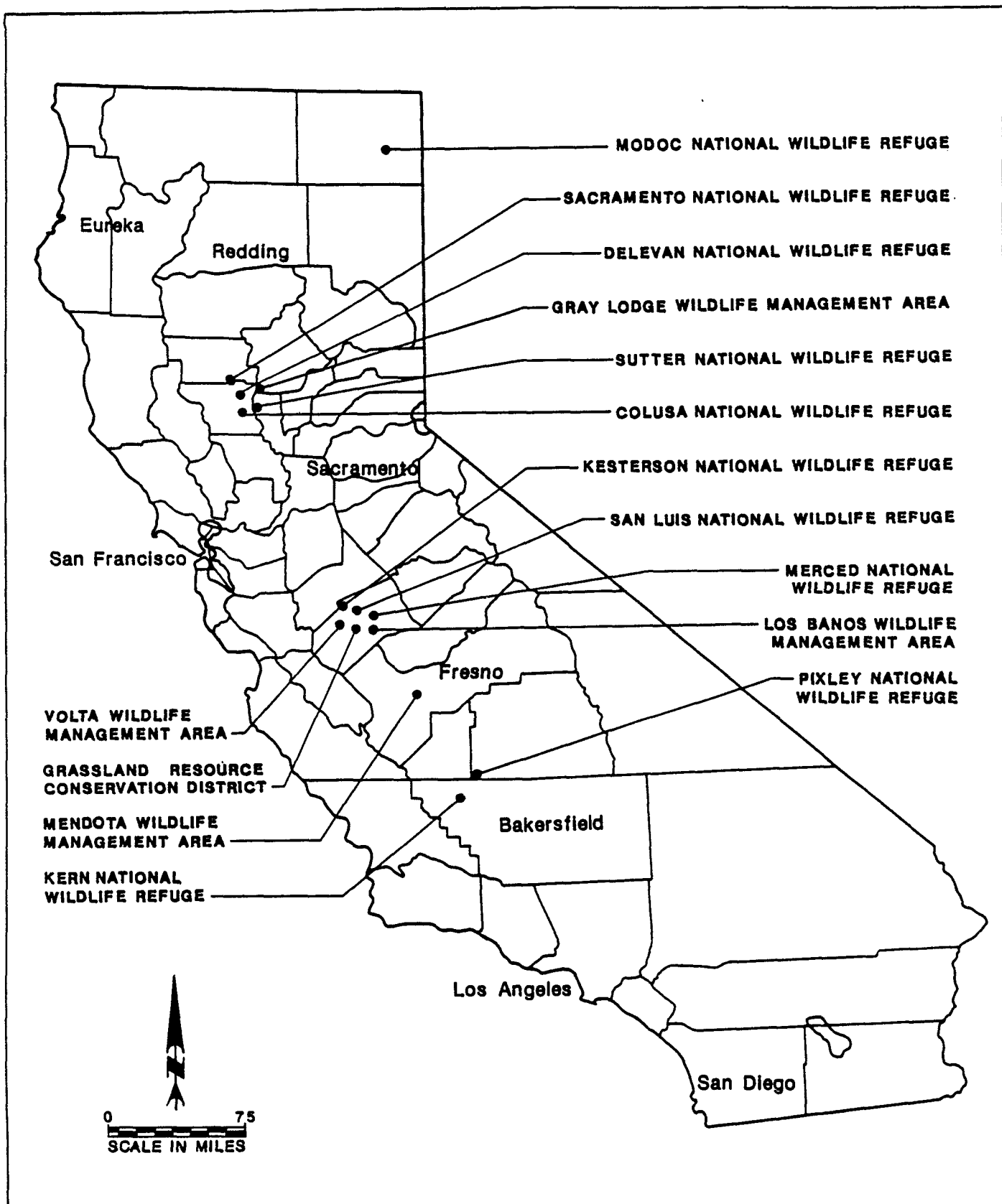


FIGURE S-1
STUDY AREA AND REFUGE LOCATION MAP

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and the DFG, need dependable water supplies to accomplish desired management goals. It is anticipated that as demands for fresh water increase in California, the quantity and quality of water available to the refuges will diminish, especially during below-normal rainfall years. Without a dependable water supply to maintain existing Central Valley waterfowl habitat, waterfowl numbers could be significantly reduced in the future. Table S-1 depicts the current water situation for each of the managed wetland areas.

RELATED INVESTIGATIONS

Present and future water development and use in the Central Valley is being redefined. Valley-wide studies underway by both Reclamation and the State of California are identifying and examining the agricultural, municipal, industrial, recreation, fish and wildlife, and water quality needs for the Central Valley's river basins. Over the next few years, 1987-1990, the State Water Resources Control Board (Board) will conduct hearings on the San Francisco Bay-Sacramento/San Joaquin Delta to receive evidence on present water use and future demand. The Board will determine beneficial and reasonable uses for the Valley's water supplies and develop water quality standards for the Bay and Delta accordingly.

Reclamation is examining water use, inbasin needs, and future demands as part of its environmental statements being prepared on contracting Central Valley Project water supplies in the Central Valley. These comprehensive documents are assessing all competing water demands and alternatives for distributing the uncommitted supply of the Central Valley Project in the Sacramento, American, and San Joaquin River Basins. Fishery, wildlife, navigation and recreational needs are being considered as well as optimization of economic benefits and repayment of the project.

At the same time, a framework within which to coordinate the operations of the Central Valley and State Water Projects has now been effected. Public Law 99-546, enacted October 17, 1986, authorized the Secretary of the Interior to sign and implement the Coordinated Operation Agreement for the integrated, orderly and efficient operations of the Central Valley and State Water Projects.

In enacting the Coordinated Operation Agreement legislation, Congress recognized the significance of wildlife refuges in the overall water picture of the Central Valley. By terms of the legislation, Reclamation is required to reserve 25 percent of the remaining uncontracted yield of the Central Valley Project until 1 year after a report on refuge water supply needs has been transmitted to Congress.

TABLE S-1
SUMMARY OF RELIABLE WATER
REQUIREMENTS

	Land Acreage (Acres)	Total Estimated Requirement Under Optimum Management (Acre-feet)	Existing Firm Water Supplies (Acre-feet)	Supplemental Reliable Needs (Acre-feet)
A. Modoc NWR	6,283	20,550	18,550	2,000
B. Sacramento NWR	10,776	50,000	0	50,000
C. Delevan NWR	5,583	30,000	0	30,000
D. Colusa NWR	4,042	25,000	0	25,000
E. Sutter NWR	2,392	30,000	0	30,000
F. Gray Lodge WMA	8,400	44,000	8,000	36,000
Total Sacramento Valley	37,476	199,550	26,550	173,000
G. Grassland RCD	52,000	180,000	50,000	130,000
H. Volta WMA	3,000	16,000	10,000	6,000
I. Los Banos WMA	3,200	25,000	6,200	18,800
J. Kesterson NWR	5,900	10,000	3,500	6,500
K. San Luis NWR	7,430	19,000	0	19,000
L. Merced NWR	2,562	16,000	0	16,000
M. Mendota NWA	12,105	29,650	24,600	5,050
N. Pixley NWR	8,800	6,000	0	6,000
O. Kern NWR	10,628	25,000	0	25,000
Total San Joaquin Valley	105,625	326,650	94,300	232,350
Total	143,101	526,200	120,850	405,350

SCOPE OF STUDY

The scope of this study was to gather, update and organize all existing and available information and generate new data as necessary, for each of the 15 wetland areas relative to current and desired water and power use and delivery, recreation and wildlife resources, and habitat management objectives. Alternative plans were to be formulated for each area providing dependable water delivery options for four water delivery regimes. The study was conducted in four phases as described below.

STUDY ORGANIZATION

Reclamation is the lead agency and responsible for the preparation of this report. The Service, DFG, DWR and CWA provided representatives on the study planning team who assisted Reclamation by providing technical expertise relative to water and wildlife resources. The Grassland RCD has provided information relative to privately managed wetlands.

Phase I - On-Site Investigations - Each area was visited by members of the planning team or their representatives for the purpose of gathering appropriate data. Sources of information included refuge management staff of the Service and DFG and representatives of local water and irrigation districts .

Phase II - Development of existing and future water supply levels - Data for each area was reviewed and developed into independent profiles of dependable water supply. Four levels of water supply were evaluated for the areas:

- Level 1 - Existing firm water supply
- Level 2 - Current average annual water supply
- Level 3 - Supply for full use of existing development
- Level 4 - Supply for optimum habitat management

Phase III - Determination of Groundwater Availability - Using available groundwater data, a determination was made of the maximum amount of water that can be developed at each area to supplement surface water in dry years.

Phase IV - Alternative Plan Formulation - Several plans were developed for each area to deliver the four levels of dependable water of acceptable quantity and quality at the appropriate time of year. Preliminary cost estimates and designs were prepared to provide an initial basis for the economic comparison of alternatives.

PUBLIC INVOLVEMENT

Since the initiation of the Refuge Water Supply Study in October 1985, numerous meetings have been held with environmental and wildlife organizations and water and irrigation districts to discuss study objectives, issues and concerns, and planning procedures. A news release discussing the initiation of the study was provided to newspapers within the study area. In addition, two public information documents were released to over two hundred agencies, organizations, legislators, and individuals providing information on the progress of the study and soliciting input on alternative water delivery plans and pertinent issues. An example of public interest in this study was demonstrated by a \$30,000 contribution provided by Grassland Water District with funds raised by CWA.

FINDINGS

This report represents the most comprehensive source of up-to-date information on the refuges of the Central Valley available. When approved, it will serve as the basic documentation required for the Refuge Water Supply Planning Report. The latter document is being developed in conjunction with the Sacramento River, American River, and Delta Export Water Contracting Environmental Impact Statements. The information contained in the final draft of those statements relative to water allocation will be essential in the development of the recommended plans in the Planning Report.

Based on the information developed from extensive investigations of each of the 15 managed wetlands studied, it is clear that each needs a dependable supply of good quality water to facilitate proper wetland habitat management for the migratory birds of the Pacific Flyway, and resident wildlife. The amount of water that is ultimately recommended for each area in the Refuge Water Supply Planning Report will depend upon, the findings of the environmental statements, the criteria established for alternative plan selection (Chapter III), priorities for water allocation (if provided by the Service), authorizations and/or requirements relative to water and power delivery, and participation in funding by non-Federal entities.

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VOLUME II

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